VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

[AN IMPROVED] FLAME ATMOSPHERE ANALYZER AND A WATER-HEATING DEVICE INCLUDING THE ANALYZER

IN THE CLAIMS:

Claims 11-20 have been added.

1. (Amended) A flame atmosphere analyzer comprising:

[-] a tube defining [in which] an air-gas intake and mixing chamber [is defined,];

[-] a gas-supply nozzle [and primary combustion-air supply means] opening into the air-gas intake and mixing chamber[,];

[-] a flame burner comprising at least one flame jet which is in flow communication with the air-gas intake and mixing chamber in order to supply an air-gas mixture formed in the air-gas intake and mixing chamber to the burner[,]; and

[characterized in that the] a primary combustion air-supply means [comprise] comprising at least one duct which has a first end in flow communication with the air-gas intake and mixing chamber and which is open at the opposite, second end in order to take in the primary combustion air in a position remote and at a predetermined distance from the air-gas intake and mixing chamber in the tube.

2. (Amended) [An] The analyzer according to Claim 1 in which the duct is tubular.

3. (Amended) [An] The analyzer according to Claim 1 [or Claim 2,] further comprising a flame-detection means connected to a circuit for controlling the supply of gas to the gas-supply nozzle in order to interrupt the gas-flow to the gas-supply nozzle when the level of oxygen in the primary combustion air taken from the duct falls below a predetermined value bringing about detachment of the flame from the burner and consequent intervention of the flame-detection means.

4. (Amended) [An] The analyzer according to Claim 3 in which the flame-detection means comprises a thermocouple flame sensor.

5. (Amended) [An] The analyzer according to Claim 4 in which the burner comprises at least two flame jets which diverge from one another and the side walls of which are substantially closed to the exterior except for an optional connecting duct between the flame jets for the lighting of one by [means of] the other, the thermocouple flame sensor being positioned relative to the jets in a manner such as to be struck by the flame of only one of them.

6. (Amended) A water-heating device [including a flame atmosphere analyzer according to one or more of the preceding claims and] comprising:

a flame atmosphere analyzer including:

(a) a tube defining an air-gas intake and mixing chamber,

(b) a gas-supply nozzle opening into the air-gas intake and mixing chamber,

(c) a flame burner comprising at least one flame jet which is in flow communication with the air-gas intake and mixing chamber in order to supply an air-gas mixture formed in the air-gas intake and mixing chamber to the burner, and

(d) a primary combustion air-supply means comprising at least one duct which has a first end in flow communication with the air-gas intake and mixing chamber and which is open at the opposite, second end in order to take in the primary combustion air in a position remote and at a predetermined distance from the air-gas intake and mixing chamber in the tube;

a combustion chamber;

[-] a main burner disposed in [a] the combustion chamber and piloted by the analyzer[,]; and

[-] means for admitting air to the combustion chamber, including partition means for the air admitted to the combustion chamber, [characterized in that] the duct [is extended] extending into the combustion chamber from the tube of the analyzer so as to take in the primary combustion air in the vicinity of the main burner.

7. (Amended) [A] The device according to Claim 6 further comprising means for discharging the combustion fumes from a first portion of the combustion chamber and in which the partition means comprises at least one flame-arresting grid for containing the flame within the combustion chamber, the at least one grid being arranged in a second portion of the combustion chamber opposite the discharge means [for the discharge of the combustion fumes], and the duct for taking in primary combustion air opening in the [said] second portion of the combustion chamber.

8. (Amended) [A] The device according to Claim 7 in which the duct opens in the combustion chamber in the vicinity of the flame-arresting grid in order to detect any changes in the oxygen level of the primary combustion air as a result of at least partial obstruction of the flame-arresting grid.

9. (Amended) [A] The device according to [one or more of Claims 6 to] Claim 8, in which the duct comprises a first portion extending from the air-gas intake and mixing chamber in the tube and a second portion forming an extension of the first portion with a predetermined inclination to the first portion and opening at the opposite, free end of the duct.

10. (Amended) [A] The device according to [one or more of Claims 6 to] Claim 9, further comprising a tank for the storage and heating of water for hygiene purposes.